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EVALUATING REFORMS IN THE IMPLEMENTATION OF HAZARDOUS WASTE POLICIES IN CALIFORNIA

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California has experienced a variety of crises resulting from the release of hazardous waste and toxic substances. The mishandling of hazardous waste by industry has created the State's 93 current superfund sites. Leaks from underground storage tanks, owned primarily by gas stations, have contaminated important sources of drinking water from groundwater. Soil contamination has led to difficult problems with urban redevelopment and school placement. These problems are particularly important because they degrade water and land resources that are critical for the state's health and economic growth. In response, it has taken several major steps over the past decade to restructure its hazardous waste regulation system.

Recent Reforms

California has instituted three major reforms in recent years to restructure its regulatory approach to try to deal more effectively with these hazardous waste releases. SB 1082 (1993) consolidated the major hazardous waste regulatory programs in one agency for each responsible local government. The same bill also required a second reform, that the local agencies replace the various fees used in the major programs with a single fee that is only expected to cover the costs of the program and must satisfy several fee accountability provisions. The third reform was to raise inspection frequency requirements for the underground storage tank section of the program. These three reforms go in somewhat contradictory directions, with the state both attempting to raise local enforcement effort, but also constraining localities ability to raise revenue. This is a fairly common situation for local environmental programs. For example, the state requires localities to undertake stormwater pollution abatement efforts but propositions 13 and 218 tightly limit the ability to raise revenues for stormwater programs.

We explore the effectiveness of these reforms by characterizing changes in local inspection and enforcement efforts of local governments. The hazardous waste generator and underground storage tank programs comprise the majority of enforcement effort. Although we show that hazardous waste releases and underground storage tank leakages are declining, we document areas of inadequate rates of inspections, enforcement actions and compliance strategies. We recommend specific changes in the 1) targeting of oversight efforts towards counties rather than cities, 2) setting fees more adequately to support local staffing needs, 3) the creation of monitoring system to track progress towards compliance once a violation is detected, and 4) strengthening local legal capacity for enforcement. We also discuss how the experience with hazardous waste regulatory

reform could be used to transfer and improve some of its more promising features to other policy areas.

California's significant restructuring of its local hazardous waste programs over the past decade offer lessons on inter- and intra-government coordination of environmental programs. The state faces similar problems coordinating programs within local governments as well as between local governments and the state in a number of environmental areas. Stormwater runoff programs, water supply protection and planning, and hazardous waste programs could be improved with greater coordination. Each of these programs shares a common tension between a desire to give local governments freedom to run their own programs and a desire to have consistent regulatory requirements and low tax and compliance burdens on businesses.

Hazardous Waste Regulation Development

Until 1993, the public response to problems of hazardous waste management was incomplete and fragmented. The prior approach was a poorly designed system of delegation and decentralizing to local governments. Under the overlapping jurisdiction of the State Water Quality Control Board, the Department of Toxic Substances Control, and California Environmental Protection Agency (CalEPA), more than 1,300 local government agencies had fragmented jurisdictions (CalEPA 2001). Each agency regulated some aspect of hazardous waste generation or treatment, or storage by firms. This "let a thousand flowers bloom" approach to local regulation produced some excellent regulatory programs, but led to a lack of consistency and uniformity. Many businesses complained of confusing and contradictory requirements from multiple regulators with often overlapping responsibilities.

Re-Structuring

In 1993, then Governor Pete Wilson supported legislation for the Certified Unified Program Agency (CUPA) program which mandated the consolidation of six major hazardous waste programs by 1997 into one agency in each responsible local government.¹ This push was driven in part by a desire to ease the regulatory burden on business by decreasing the number of overlapping inspections, fees, and permits. However, the legislation also contained provisions intended to improve the monitoring and enforcement of hazardous waste laws, requiring that every area be under the jurisdiction of a county or city CUPA and instituting minimum inspection procedures and frequencies.

The CUPA program generally operates under the auspices of the Federal Resource Conservation and Recovery Act (RCRA). RCRA mandates the tracking and monitoring of hazardous waste from its generation to its disposal. The Department of Toxic Substances Control (DTSC) is charged with ensuring that RCRA requirements are followed in California. It delegates authority to local governments that implement the CUPA program through inspections and enforcement actions in four areas: storage tanks, hazardous waste generating facilities, safety plans for hazardous waste releases, and

treatment and recycling facilities. The California EPA, in conjunction with the DTSC and several other agencies, then oversees CUPA efforts and is directly responsible for some larger facilities.

A key feature of the CUPA program is that cities can assume responsibility for implementing hazardous waste programs if they petition their surrounding county and it approves. This selection process has produced a set of cities with distinctive characteristics. One might expect that volunteer cities are likely to prefer a higher level of regulation than their surrounding county. It turns out that this hypothesis is correct in the case of the underground storage tank (UST) and hazardous waste generator (HWG) programs (Cutter and DeShazo, 2006). Various indicators of regulatory effort show the involved cities are doing a better job of regulation than counties.

The framers of CUPA legislation expected every California county to set up a CUPA by January 1997. However, it has been difficult to persuade some of the smaller rural counties to undertake the expense of setting up a unified program. By 2002, four years after the 1997 date, 14 counties still had not set up unified programs (CalEPA 2002). As of February 2005, seven years after the original deadline, all counties now have CUPA agencies.² The difficulty of bringing the small, rural counties into the program reflects the problems small jurisdictions, cities as well as counties, have in setting up new administrative structures. The key difference between cities and counties is that the smaller and less well-organized cities never become eligible to be CUPAs; either because they were not interested in CUPA status or because they did not receive approval.

Relatively quick qualification of the remaining counties for CUPA status after the State initiated grants for rural CUPA set-up and training indicates that economies of scale may be such that it is much more difficult for small jurisdictions to set up and run coordinated programs in hazardous waste and other areas. This result highlights the importance of the selection process described in the preceding paragraph. By limiting the type and number of cities that can qualify for CUPA status, the legislation probably kept quite a few smaller cities that would have difficulty running the program from gaining CUPA status.

Inspection and Enforcement Mandates

The CUPA program was initiated with a modest, triennial, inspection requirement for underground storage tanks. A key change came with the passage of SB 989, which mandated annual inspection for USTs beginning January 1, 2000. This bill was motivated by the increasing extent of MTBE contamination from USTs. Only the largest hazardous waste generators had any inspection frequency requirements, though it appears that triennial inspections have been an unofficial goal of the program. The inspection mandate in this program allows us to examine whether the mandate was effective and whether it had the effect of decreasing effort in related programs.

Single Fee Program

Unlike many other local environmental programs, fees to cover the cost of the CUPA program are both authorized in state statute and are supposed to be dedicated to the CUPA program. The “single fee provisions” of the CUPA legislation limit fees to the costs of service and are similar in direction to recent propositions, such as Prop 218, that attempt to limit fees to cost of service so that fees are not used to fund unrelated programs. It is unclear whether the single fee paperwork and fee accountability requirements for governments have constrained CUPA revenues. Local governments may refrain from charging high enough fees to cover all indirect expenses because these types of expenses may be difficult to justify under the fee accountability provisions. However, even with these requirements, the CUPA programs have a more stable revenue footing than other programs because their revenue base is explicitly authorized in statute.

Leaking Underground Storage Tank Regulation

Among CUPA programs, the leaking underground storage tanks and hazardous waste generators represent the two largest threats in California. The principal public concern about underground storage tanks in recent years has been the contamination of groundwater supplies with MTBE, a gasoline additive. Issues of groundwater contamination, especially by MTBE, have grown in importance. The CUPAs are the front-line regulators of USTs, which are responsible for the lion’s share of MTBE contamination, as well as contributing to other soil and water contamination. In response to the MTBE crisis, California increased the required inspection frequency for tanks from triennially to annually, effective in FY 2000-01 (SB 989).

Additionally, CUPAs implemented the federal requirement that all tanks be upgraded to new, more leak proof standards by the end of 1998. By the end of 1999, most tanks were in compliance. The data from California, shown in figure 1, show that the tank standards upgrade seems to have reduced the number of leaks substantially.

Because most of the leaks from USTs occur in the county CUPA’s jurisdiction (as opposed to in the 29 cities), it is not surprising these declines in leaks mostly occurred in the county CUPAs.³ Figure 2 shows the trend for the average number of leaks per facility with a UST for cities and counties. The average rate of leaks has declined in both the city and county CUPAs since tanks were upgraded to the 1998 requirements. The figures raise several interesting questions. Figure 2 shows that cities, on average, have fewer leaks per UST facility, even in the post 1999 period, at a time when there should not be significant differences in tank construction. It is also difficult to attribute these differences to differences in the size or type of facilities between cities and counties, since well over 90% of the UST facilities are gas stations which almost all have the same number of USTs (3 to 4 on average). However, it appears that the gap between cities and counties is closing in recent years.

What accounts for the differences between cities and counties? The intensity of regulation may account for some of this observed difference in leak rates. Cities, on

average, do far more inspections per UST facility than counties. Over the entire period of CUPA operation, cities conducted close to double the number of inspections that counties did (about 1.3 inspections/year for cities versus about .7 inspections/year by counties). For the recent period of FY 2001-2003, cities conducted approximately 1.3 inspections per year while counties have improved to .8 inspections per year. These differences are statistically significant at the 1 % level in each period.

Our data indicate that both cities and counties are not meeting the inspection requirement a significant percentage of the time, but cities are outpacing counties. In FY 2003 only 11 of 42 reporting counties averaged at least 1 inspection/year while 16 of 27 reporting cities averaged at least annual inspections in the UST program. Since FY 2000, when the current annual inspection rate requirement was installed, on average cities have met the requirement 63% of the time while counties have only met the requirement 20% of the time.

Given the larger number of leaks in the counties, we would expect to see an equal or greater rate of reported violations for USTs in the counties. However, there are many more reported violations per UST facility in the authorized cities. In the 2001-2003 period, violations per UST facility were about 50% higher in the cities, despite the lower leak rates. This outcome suggests that the number of violations discovered in this program is largely a function of monitoring effort.

Of course, inspections are just one part of the enforcement story. For effective enforcement, local governments must follow up on inspections by correcting any violations they find through formal or informal enforcement actions. Again, it appears cities are outperforming counties when we look at the ratio of enforcement actions to violations. In recent years (FY 2001-2003), the weighted average of enforcement actions/violations shows cities respond with almost twice as many enforcement actions to each violation.⁴

Interpreting the Data

The analysis above suggests that SB 989's focus on increasing inspection levels is well targeted. The cities, with their generally higher levels of inspection, appear to detect more violations and have fewer leaks. Of course, the annual inspection requirement impacts all low-inspection jurisdictions, not just the counties. The data indicate that the inspection mandates did increase inspections.

Jurisdictions that averaged less than annual inspections in the pre-mandate period (1998-2000) had a statistically-significant increase in their inspection rates from the pre-mandate to the post-mandate (2001-2003). They increased inspection rates from about 0.6 inspections/year to .85 inspections/year. Those jurisdictions that already averaged annual or more frequent inspections before 2001 actually saw their inspection rates decrease slightly on average. But their average of 1.15 inspections/year in the 2001-2003 period was still comfortably above the requirement. This evidence suggests that SB 989's mandate had some effect on inspection rates.

Preventing Pollution

Inspections are not the end goal; pollution prevention is the aim of the inspection requirements. On average, the jurisdictions with higher inspection rates have also had higher rates of reported leaks. However, the two sets of jurisdictions (those that were above and below one inspection per year in the pre-2001 period) have had their leak rates converge since the annual inspection requirement was instituted. An explanation for the higher leak rates in the high inspection jurisdictions is that minor leaks may not be discovered in low-inspection rate jurisdictions. While major leaks that contaminate large amounts of soil or groundwater are very likely to be discovered even if inspections don't occur until years later, it is possible that evidence of minor leaks could fade away over the interval.

The violation rate evidence supports this explanation. The higher-inspection group catches almost twice the violations overall (.25 per facility compared to .13 per facility). Both groups increased the violations per facility from the first to the second period, but the increase in the low-inspection group was 169% of the first period average compared to a 137% increase for the high-inspection group. A plausible conclusion to draw from the leak and violation rate evidence is that the increase in inspections led to a greater detection of leaks and violations. The greater detection probabilities from more inspections should lead to a lower frequency of the very damaging large leaks because leaks will be detected before they become very damaging. Also, more inspections should lead to businesses taking greater care in operating tank facilities since careless operation is more likely to be detected.

The city CUPA programs appear to be generally in, or close to, compliance with state requirements and to be pursuing vigorous UST regulatory enforcement programs. However, the county CUPAs have more work to do to raise their inspection frequency up to state-mandated minimums. In addition, it appears the county CUPAs can do more to pursue the violations they do uncover in their inspections. Recently introduced state legislation, which would give all CUPAs the ability to assess administrative penalties, might assist the counties in increasing their enforcement. The combination of greater inspection and enforcement frequency could help counties lower the tank leak incidence rate to city levels and slow further degradation of California's soil and water degradation.

Hazardous Waste Management Regulation

The Hazardous Waste Generators and Large Quantity Generators programs regulate a wide variety of businesses from small paint shops to dry cleaners to large manufacturing concerns. Unlike the UST program, the state does not track all releases of pollutants from facilities in these programs. However, the federal Toxics Release Inventory (TRI) database tracks hazardous waste releases from a wide variety of (mostly manufacturing) facilities. The TRI database overlaps considerably with the firms in these programs and gives us our best picture of toxic pollutant trends in California.

Figure 3 shows total tons of hazardous waste environmental releases in California.⁵ For all years, about 80% of environmental releases are airborne, with the rest split between underground injection and soil. Since the inception of the CUPA program, total releases are down 23%. The CUPA program may be responsible for some portion of that decline, but it is likely that larger economic factors – such as the decline in industrial output in California – explain some of the decline.

An examination of inspection rates again shows cities doing more than counties. Over FY 2001-3, cities averaged .66 inspections/facility per year while counties averaged .41. For the large quantity generators, there are not large city-county differences. Counties undertake slightly more inspections per year but this is probably because cities have few or no large quantity generators so we have few observations among the cities.

Figure 4 shows the inspection rate trends for Hazardous Waste Generators. While there is no official state requirement for inspection frequency in the generator program, there appears to be an expectation from CalEPA auditors that CUPAs inspect at least triennially. We computed a 3-year average of inspections/facility to determine whether jurisdictions were on average completing enough inspections to meet this goal. Under this measure, by 2003, 75% of cities and 43% of counties were doing enough inspections to fulfill state requirements. Cities are doing better than counties on this measure though the gap is not as large as it is in the UST program.

Our final measure of regulatory effort is the enforcement rate. Figure 5 shows the distribution of enforcement rates. The median enforcement rate for both cities and counties hover around 1.0, meaning, on average, Hazardous Waste Generator violations are followed up by at least one informal or formal enforcement action. There are no significant differences between cities and counties on this measure.

Local officials often complain that state mandates pull resources away from other programs that may be more important to the local area. In the case of the CUPAs, the most likely resource loser from the UST annual inspection requirement would be the generator program. The programs are both operated under the same single-fee funding structure. Thus, the logical way to fund increased UST inspections is through decreased effort in the generator program. Also, since there is no official state inspection-rate requirement in the generator program, localities could cut inspection rates to recoup the extra funding needed to meet the UST mandate with no significant penalty from the state.⁶ The data show a slight decline of about 10% in generator inspection rates in the jurisdictions that were subject to the UST mandate. However, this decline is statistically insignificant.

It appears in this case that the UST mandate did not significantly reduce the amount of resources going to the generator program. Jurisdictions either relied on more resources from the general fund or were able to raise their fees. This program is atypical among environmental programs in that it has a dedicated funding source that is not subject to the more stringent requirements of Propositions 218 or 13. However, one lesson that policymakers can take away is that it may be easier to obey state mandates

without gutting programs that compete for the same resources where there is a dedicated fee structure.

Enforcement and Tracking

There have been several deficiencies in the design of the enforcement and tracking portion of the CUPA programs. A key problem in the initial design was that half of the fine revenue for hazardous waste program violations prosecuted by local governments went to the DTSC. This was a large disincentive to local agencies' pursuit of often expensive environmental cases. In response to a report from the Legislative Analyst's Office (**LAO 2001**) criticizing the sharing law and other enforcement problems, AB 711 (2001) was passed and now all fines stay in local hands.

The other key enforcement weakness identified by the LAO report is the lack of consistency across CUPA programs. One reason for this inconsistency was the lack of a uniform process for administrative enforcement actions to correct or punish violations. Some localities had implemented their own administrative enforcement process for other programs, but many have not. Administrative processes are cheaper and faster than civil penalties because they usually do not require the same level of proof as a civil case and there is no need to convince a local DA to take the case. Recent legislation (AB 2481, 2002) has established an administrative enforcement process for all programs that will hopefully increase enforcement consistency across CUPAs.

However, currently we lack the information to accurately judge the level of enforcement or the differences across local programs. At the state level, CUPAs only report summary totals of violations and enforcement actions. This reporting methodology is very different from most national EPA enforcement databases which document which facility committed a violation, the extent and type of the violation, when the violation was corrected, and any enforcement actions that occurred as a result of the violation.⁷ This type of information is essential to determining whether persistent violators eventually face enforcement action and for determining how long violations go uncorrected. A similar system would be very useful to guide state oversight of the CUPA program. The CUPA program is currently developing plans for more complete reporting, but it is unclear if violations and enforcement tracking will meet national standards. Current plans are to report violation and enforcement information for the larger hazardous waste generators by early 2006, and later extend this reporting to other facilities.

Recommendations and Conclusions

The process of restructuring California hazardous waste had the effect of choosing cities that are, on average, good actors in their hazardous waste programs. The various hoops cities had to jump through tended to weed out cities with very low regulatory effort. This system of jurisdiction selection has the advantage that it clearly defines for state regulators the jurisdictions that are and are not likely to mount vigorous

enforcement programs. In the CUPA case, State regulators should focus their efforts on improving county programs through either greater monitoring or more financial support.

But the analysis in this paper also suggests that the system of jurisdiction selection used in the hazardous waste program could be expanded to other areas with even greater success. If cities are selected in a similar manner for a new area or the restructuring of existing programs, the State should concentrate its program-building efforts on counties. Those cities that are willing to go through the expense and trouble of obtaining certification are likely to fulfill requirements.

Two policy changes would improve inspection behavior by CUPAs. First, many CUPAs implement inspection fee structures that are too low to support the staffing levels needed to achieve compliance. One solution is for the State (via the Department of Toxic Substance Control) to set minimum fees based on the cost of fully-compliant inspection rates. This minimum fee structure should be based on the CUPA with the lowest statewide costs and indexed to state rate of wage inflation. Second, the Department of Toxic Substance Control needs to increase its technical assistance and its oversight to counties. The rural CUPA reimbursement fund is a good start, but it should be recognized that urban and suburban counties also need assistance. Both actions are needed since counties appear less able and willing to undertake adequate inspections.

The move towards annual inspection rates seems like a significant success for the program. Not only has it brought inspection rates up for jurisdictions that originally had lower inspection rates, but those same jurisdictions are detecting more violations and leaks. It appears that the higher inspection rates have resulted in concrete environmental benefits. Also, we don't see significant reductions in effort in the hazardous waste program as a result of the UST annual inspection mandate. The dedicated fee structure is probably part of the reason a state mandate could be successful. State policymakers should be cautious about local government environmental mandates in programs that do not have dedicated fee structures. It is likely we would see greater negative effects on programs that compete for the same funds without such a fee structure.

The adequacy of CUPA enforcement behavior is much harder to evaluate.⁸ No firm-specific violation or enforcement data are currently reported. More critically, the CUPAs do not have a system to monitor the re-achievement of compliance once a violation is identified. The State should ensure that the new Unified Program Data System includes these elements. In addition, the State has long recognized the need to strengthen CUPA's legal capacity to develop the evidentiary basis for prosecuting violators. Better tracking and documenting the extent of firms' non-compliance behavior would also strengthen CUPA legal capacity.

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Figure 1. Reported Leaks from Underground Storage Tanks by Media Affected

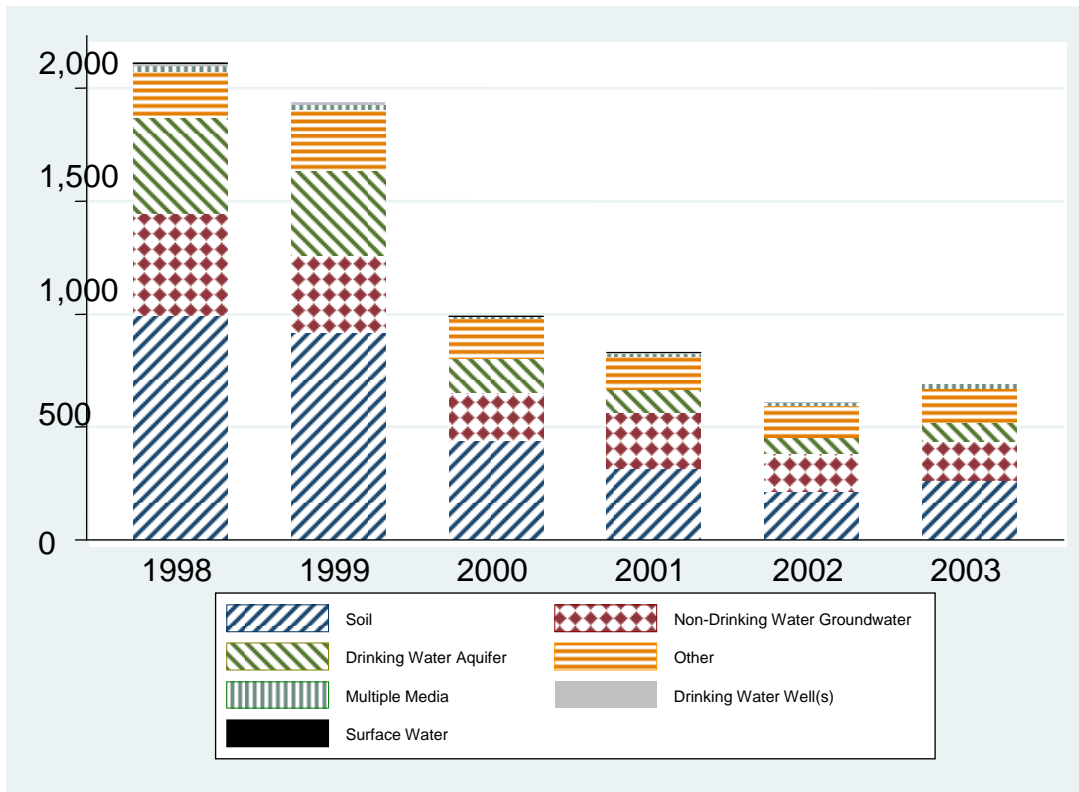


Figure 2. Reported Leaks from Underground Storage Tanks

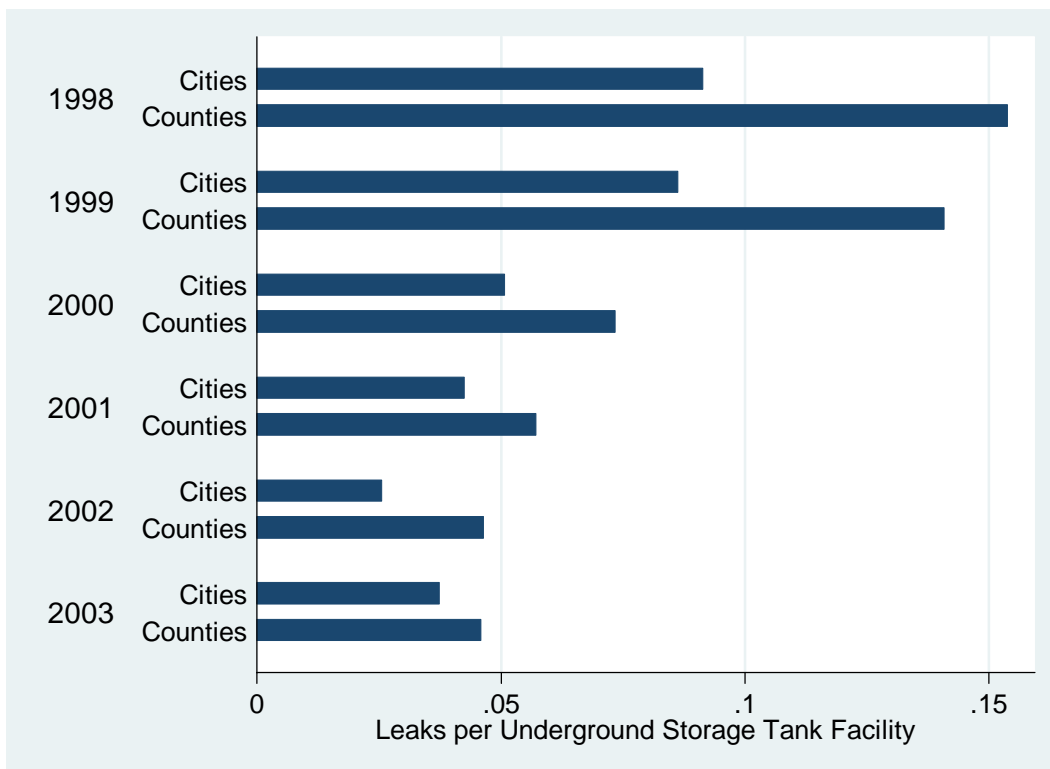


Figure 3. Hazardous Waste Releases by Media Affected

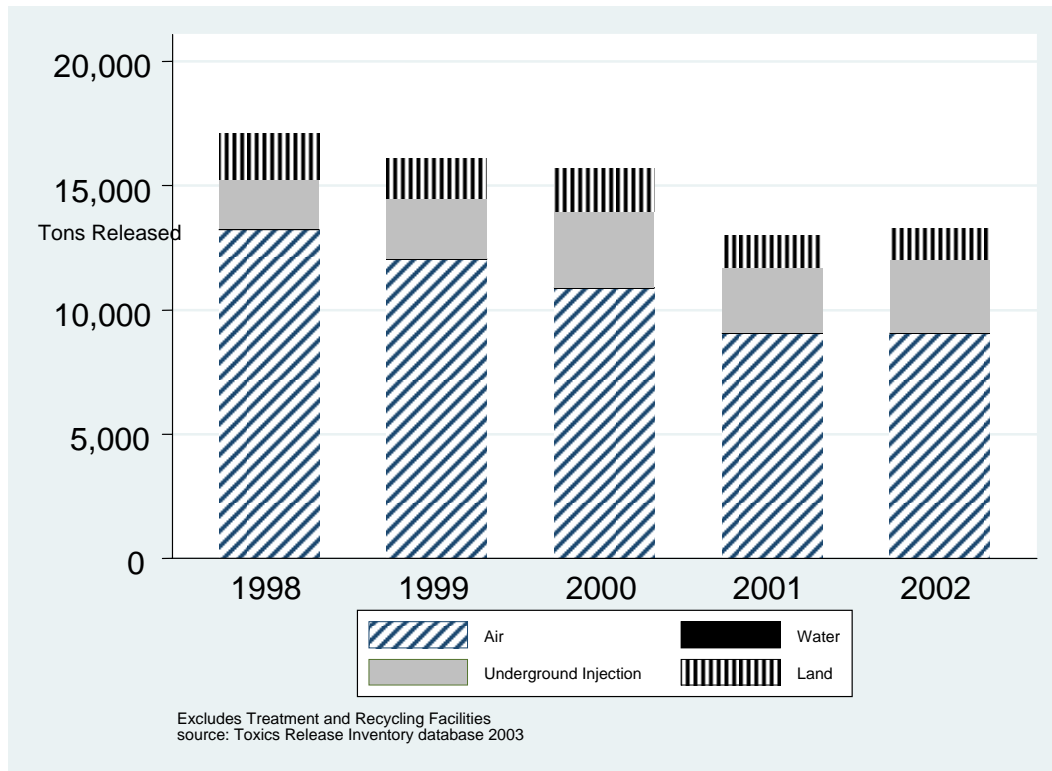


Figure 4. Mean Inspections per facility for Hazardous Waste Generators

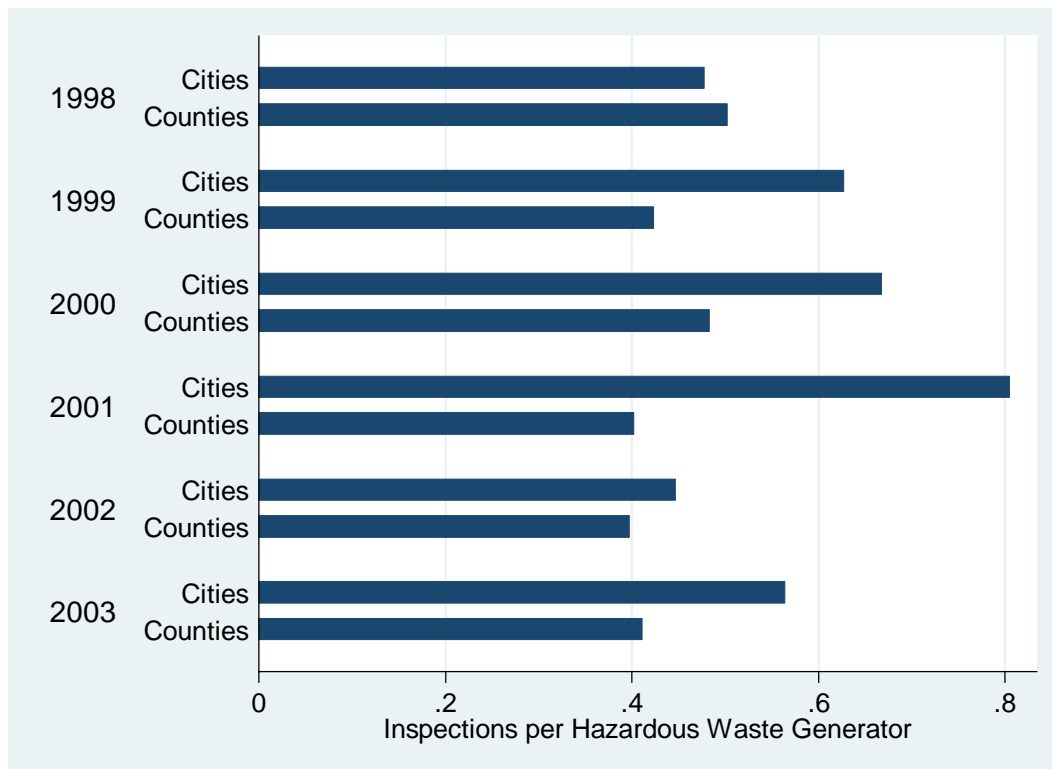
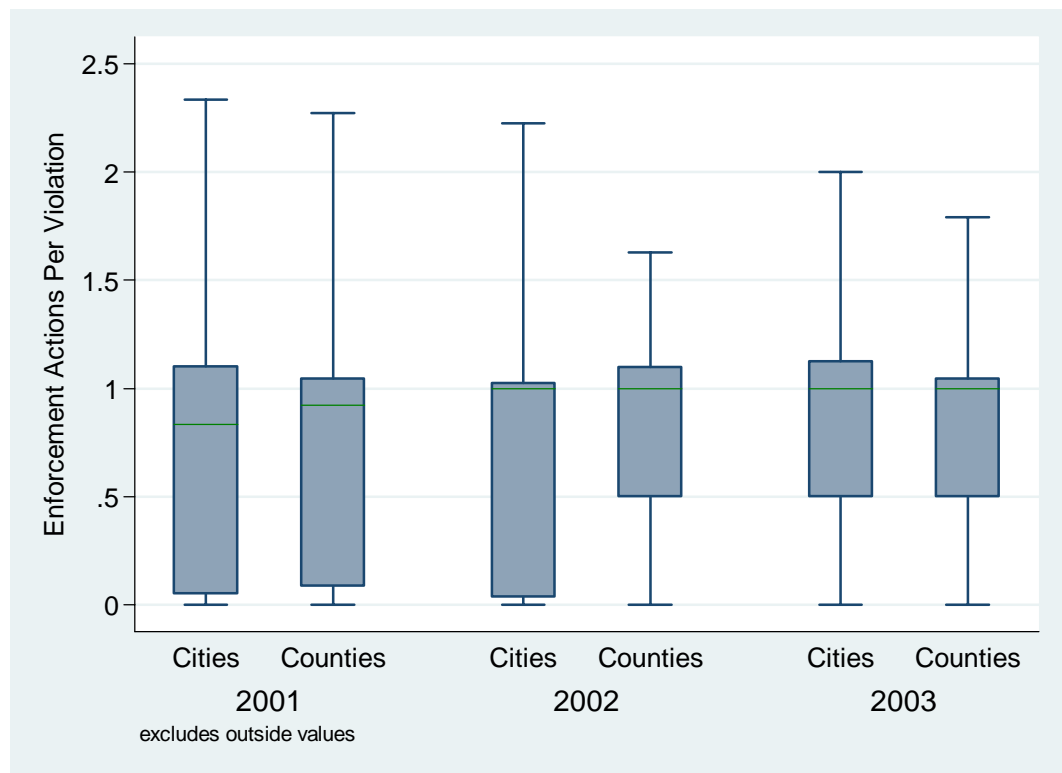


Figure 5. Enforcement Rates per Violation for Hazardous Waste Generators



Endnotes

¹ The six programs were under and above-ground storage tanks, Hazardous Waste Generators, California Accidental Release Prevention Program (CalARP), Hazardous Release Response Plans and Inventories (HMMRP), Permit by Rule, and Large Quantity Generators.

² One policy innovation that brought the remaining counties to CUPA status was a “rural reimbursement” account that pays some of the administrative costs of CUPA set up and operation (CalEPA 2002). In addition, two counties (Imperial and Trinity) do not have CUPA agencies of their own, but instead their CUPAs are administered directly by DTSC.

³ Data are for 44 of the 58 California counties. Fourteen counties did not have CUPA status until after 2002 meaning that data were unavailable for these counties. These counties generally did not qualify because they were not operating hazardous waste programs to State standards. Had data been available, it is likely that inclusion of these counties would make county performance for underground storage tanks appear worse than is presented here.

⁴ Weighting is by number of UST facilities, so that small jurisdictions do not overly sway the mean. One difficulty with these results is the large number of observations (an observation is a jurisdiction year) where zero violations occur and thus enforcement actions per violation is undefined.

⁵ These facilities also generate waste that is transferred off-site for recycling or disposal, but we do not include this waste because it may not end up in Southern California and because there may be some double-counting of these transfers in the current TRI database.

⁶ The other CUPA program elements have state inspection-rate requirements.

⁷ For USTs there is a system (LUSTIS/Geotracker) that tracks leaks and subsequent regional or state board enforcement actions.

⁸ Both Legislative Analysts Office 2001 (“Analysis of the 2000-01 Budget Bill: State Agencies Can Do More”) and the California State Auditor 1999 (“DTSC: The Generator Fee Structure is Unfair, Recycling Efforts Require Improvements, and State and Local Agencies Need to Fully Implement the Unified Program”) have noted weaknesses in CUPA enforcement capabilities and performance.